



OUR REF: A5182/24/VR/V0

5th November 2024

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By Email (wes@probuk.co.uk)

Dear Wesley,

Dobfield Road, Rochdale
Garden Validation Letter Report

Background and Terms of Reference

This report provides a summary of the validation of the imported soil cover material used in gardens at a new development at Dobfield Road, Rochdale.

This validation report should be read in conjunction with the remediation strategy that was developed by Earth Environmental & Geotechnical Ltd dated October 2023 (Reference: A5182/23/RMS).

The remediation strategy stipulated a soil cover system within front and rear gardens of Plots 4 to 6.

Scope of Work

A site visit was conducted on the 15th of October 2024 to validate the thickness of soil cover system and to take samples for laboratory chemical analysis.

Chemical samples were recovered with a sampling frequency of at least one sample for every two plots within the cover system (representing 1 sample per 50m³, as per relevant guidelines).

Chemical testing has been performed by DETS, a UKAS and MCERTS accredited laboratory. Appendix B provides a copy of the testing results.

The results have been compared to a residential end use (with plant uptake) criteria for the long-term protection of human health.

The hand dug pit sampling locations are shown in Figure 1 overleaf.

Soil Horizons

The imported and stockpiled soil cover material that has been placed in the garden areas on site at Dobfield Road, Rochdale, has been measured and sampled.

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The topsoil material was encountered in all locations between ground level and a maximum depth of 0.25m bgl. The topsoil was generally described as a dark brown sandy slightly gravelly clay.

The subsoil material was encountered below the topsoil in all locations to a maximum depth of 0.75m bgl and was generally described as brown sandy slightly gravelly clay or brown slightly sandy slightly gravelly clay.

Appendix A provides a description of the soil profile at each location.

There was no visual or olfactory evidence of contamination observed during the site sampling process.

Figure 1: Sampling Location Plan



Chemical Testing

5no. samples were taken from the soil cover system material in the hand dug pit locations.

Chemical testing has been performed for a wide range of analytes including asbestos screen, pH, total organic carbon, total sulphate, sulphide, total cyanide, arsenic, chromium, hexavalent chromium, copper, lead, selenium, zinc, cadmium, mercury, nickel, vanadium, barium, beryllium, water soluble boron, mono phenol, speciated hydrocarbons and speciated PAH's.

At a Tier I stage the long term (chronic) human health toxicity of the soil has been assessed with reference to DEFRA/Environment Agency Contaminated Land Exposure Assessment (CLEA) Soil Guideline Values (SGV) for generic site land uses, soils, and exposure.

Where Environment Agency generic guidance is absent, reference has been made to the Chartered Institute of Environmental Health (CIEH) S4ULs for human health risk assessment.

In the case of arsenic, cadmium, hexavalent chromium, lead, benzene, naphthalene, and benzo(a)pyrene DEFRA Category 4 Screening Levels have been adopted. The results have been compared to residential with plant uptake and 1% soil organic matter (SOM).

Table 1: Assessment of Soil Chemical Data

Determinand	C4SL/S4UL Levels Resi w/ HP SOM 1% (mg/kg)	VP1 0.40m Subsoil	VP2 0.10m Topsoil	VP3 0.10m Topsoil	VP4 0.60m Subsoil	VP4 0.20m Topsoil	No of Exceedances
Metals							
Arsenic	37	9	14	14	13	10	0
Beryllium	1.7	< 0.5	0.6	0.6	0.6	0.5	0
Boron	290	< 1	< 1	< 1	< 1	< 1	0
Cadmium	22	0.2	0.3	0.3	0.2	0.2	0
Chromium	910	15	16	16	15	14	0
Chromium VI	21	< 2	< 2	< 2	< 2	< 2	0
Copper	2400	24	38	39	33	29	0
Lead	200	63	73	85	72	54	0
Inorganic Mercury	40	< 1	< 1	< 1	< 1	< 1	0
Nickel	130	16	16	17	16	16	0
Selenium	250	< 2	< 2	< 2	< 2	< 2	0
Vanadium	410	21	24	24	23	20	0
Zinc	3700	66	69	72	65	63	0
Petroleum Hydrocarbons							
Benzene	0.087	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
Toluene	130	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0
Ethylbenzene	47	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
o-xylenes	56	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
m-xylenes	56	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
p-xylenes	56	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0
Aliphatic EC >5-6	42	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aliphatic EC >6-8	100	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Aliphatic EC >8-10	27	< 2	< 2	< 2	< 2	< 2	0
Aliphatic EC >10-12	130	< 2	< 2	< 2	< 2	< 2	0
Aliphatic EC >12-16	1100	< 3	< 3	< 3	< 3	< 3	0
Aliphatic EC >16-21	65000	< 3	< 3	< 3	< 3	< 3	0
Aliphatic EC >21-35	65000	< 10	13	< 10	< 10	< 10	0
Aromatic EC >5-7	70	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aromatic EC >7-8	130	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Aromatic EC >8-10	34	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >10-12	74	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >12-16	140	< 2	< 2	< 2	< 2	< 2	0
Aromatic EC >16-21	260	< 3	< 3	< 3	< 3	< 3	0
Aromatic EC >21-35	1100	< 10	22	< 10	< 10	< 10	0
Polycyclic Aromatic Hydrocarbons							
Naphthalene	2.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Acenaphthylene	170	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Acenaphthene	210	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Fluorene	170	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Phenanthrene	95	< 0.1	0.17	< 0.1	< 0.1	< 0.1	0
Anthracene	2400	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Fluoranthene	280	< 0.1	0.35	0.14	0.15	0.11	0
Pyrene	620	< 0.1	0.42	0.13	0.15	< 0.1	0
Benzo(a)anthracene	7.2	< 0.1	0.18	< 0.1	< 0.1	< 0.1	0
Chrysene	15	< 0.1	0.18	< 0.1	< 0.1	< 0.1	0
Benzo(a)pyrene	5	< 0.1	0.26	< 0.1	< 0.1	< 0.1	0
Benzo(b)fluoranthene	2.6	0.27	< 0.1	< 0.1	< 0.1	0.27	0
Benzo(k)fluoranthene	77	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Indeno(1,2,3-cd)pyrene	27	< 0.1	0.19	< 0.1	< 0.1	< 0.1	0
Dibenz(a,h)anthracene	0.24	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0
Benzo(ghi)perylene	320	< 0.1	0.22	< 0.1	< 0.1	< 0.1	0
Phenols							
Phenol	120	< 2	< 2	< 2	< 2	< 2	0

Notes for Table 1

All units in mg/kg.

Concentrations in **red** above assessment criteria for residential.

Based on the above table, no samples tested from the imported soil cover material contained concentrations of contaminants in exceedance of the screening criteria relevant to residential end use with plant uptake.

No asbestos fibres or fragments were identified in the samples taken from the tested areas.

Table 2 below provides a summary of the ground conditions at each location.

Table 2: Summary of Cover System Thickness

Location	Cover System Thickness (mm)	Sufficient Cover Thickness (Y/N)
VP1	200 Topsoil & 400 Subsoil	Y
VP2	200 Topsoil & 550 Subsoil	Y
VP3	150 Topsoil & 500 Subsoil	Y
VP4	210 Topsoil & 490 Subsoil	Y
VP5	250 Topsoil & 650 Subsoil	Y

Conclusions & Recommendations

The imported soil cover system material used in the residential gardens and landscaped areas at Dobfield Road, Rochdale has been validated by Earth Environmental & Geotechnical Ltd.

The thickness of the cover system in the rear and front gardens of all plots is considered suitable and adheres to the remediation strategy for the site.

Should you have any queries regarding the contents of this report, please feel free to contact me.

Yours Sincerely,

Adam Czarnecki

Director

For and on behalf of Earth Environmental & Geotechnical Ltd

Appendix A Hand Dug Pit Logs
Appendix B Soil Chemical Testing Results
Appendix C Soil Assessment Criteria

APPENDIX A

HAND DUG PIT LOGS

APPENDIX B

SOIL CHEMICAL TESTING RESULTS

APPENDIX C

SOIL ASSESSMENT CRITERIA

Assessment Criteria for Imported Soils in Garden Areas

Inorganic Compounds	Assessment Criteria - Residential with Homegrown Produce (mg/kg)		
Arsenic	37		
Cadmium	22		
Chromium (III)	910		
Chromium (VI)	6		
Lead	200		
Inorganic Mercury	40		
Nickel	130		
Selenium	250		
Copper	2400		
Zinc	3700		
Organic Compounds	1% SOM	2.5% SOM	6% SOM
Naphthalene	15	36	85
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	5.0	5.0	5.0
Dibenz (a, h) anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd) pyrene	27	36	41
Benzo (g, h, i) perylene	320	340	350
Benzene	0.2	0.41	0.87
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130 (48) ^{vap}	330 (118) ^{vap}	760 (283) ^{vap}
Aliphatic EC >12-16	1100 (24) ^{sol}	2400 (59) ^{sol}	4,300 (142) ^{sol}
Aliphatic EC >16-35	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aliphatic EC >35-44	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aromatic EC 5-7	70	140	300
Aromatic EC >7-8	130	290	660

Assessment Criteria - Residential with Homegrown Produce (mg/kg)			
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aromatic EC>8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260 ^f	540 ^f	930 ^f
Aromatic EC >21-35	1,100 ^f	1,500 ^f	1,700 ^f
Aromatic EC >35-44	1,100 ^f	1,500 ^f	1,700 ^f
Asbestos Fibres	< 0.001%		

Purpose	Classification	Testing Frequency	Chemical Analysis
Source Testing & Suitability For Use	Topsoil	1 sample per 50m ³ [Minimum of 3 per source]	➤ Inorganic Compounds. ➤ Speciated Polycyclic Aromatic Hydrocarbons. ➤ Speciated Petroleum hydrocarbons. ➤ Asbestos Identification.
	Sub-Soil	1 sample per 50m ³ [Minimum of 3 per source]	